1,139,036

PATENT SPECIFICATION

DRAWINGS ATTACHED

1,139,036

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Int. Cl.:—**B 65 d 27/00.**

COMPLETE SPECIFICATION

The Inventor of this invention in the sense of being the actual deviser thereof within the meaning of Section 16 of the Patents Act 1949 is:—Russell Leroy Butler, a Citizen of the United States of America, of 3711 Boston Street, Midland, County of Midland, State of Michigan, United States of America.

Plastics container for tobacco products

We, THE DOW CHEMICAL COMPANY, a Corporation organised and existing under the laws of the State of Delaware, United States of America, of Midland, County of Midland, State of Michigan, United States of America, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to the packaging of tobacco products and more particularly relates to packaging tobacco products in readily openable synthetic resinous containers.

In accordance with this invention there is provided a plastics container for tobacco products comprising one or more hermetically sealed compartments the container being made of synthetic resinous thermoplastic film having three layers, the two outer layers each being composed of a polyolefin film and the inner layer comprising a barrier resin, the three-layer film being made by separately heat-plastifying a stream of the barrier resin and a stream of the polyolefin material, deforming the polyolefin stream so as to form a layer surrounding the barrier resin stream, deforming the thus formed composite stream into a film, and passing to a cooling zone.

Packages in accordance with the present invention are readily prepared utilizing a variety of synthetic resinous materials. The material from which the package in accordance with the present invention is advantageously formed is a synthetic resinous film or sheet having a thickness of from 1.2 mils (.03 mm) to 8 mils (0.2 mm) and preferably having a thickness of from 2 to 6 mils (.05 to .15 mm). When the material from which the package is formed is thinner than 1.2 mils (0.3 mm) it has a relatively undesirable hand and does not offer sufficient mechanical protection or desirable stiffness to protect the contents such as cigars or the like. When the thickness of the film exceeds 8 mils (0.2 mm) it becomes too stiff for convenient handling.

Beneficially, films having a thickness of from 2 to 6 mils (.05 to .15 mm) are preferred wherein the resultant package is neither too stiff nor too limp and provides adequate mechanical protection for the material therein. Essentially, the film or sheet utilized in preparing the packages comprises at least three layers of synthetic resinous thermoplastic material and beneficially, each of the layers is transparent to afford ready inspection of the product contained therein without the necessity of breaking the hermetic seal. The inner or control layer of the film is beneficially formed from an oxygen and moisture vapour barrier resin such as halogenated hydrocarbon resins e.g. polymers of vinylidene chloride containing minor proportions of other monomers copolymerizable therewith.

By the term "polyolefin" is meant polyethylene, polypropylene resinous copolymers of ethylene and propylene, and copolymers of ethylene and/or propylene with minor proportions of other olefinically unsaturated monomers.

A wide variety of barrier materials may be employed in the central layer of films in accordance with the present invention. Particularly suited as barrier layers are combinations of vinylidene-chloride polymers, vinyl-chloride polymers, vinylidene-fluoride polymers and extrudable mixtures thereof. The requirement for the central layer is that the material be extrudable within a sheath of another polymer and that the composition have the desired gas and moisture vapor transmission barrier characteristics. Particularly advantageous and beneficial are extrudable compositions of vinylidene-chloride polymers, wherein the polymers contain at least about 70 weight percent vinylidene-chloride, the remainder being one or more olefinically unsaturated monomers copolymerizable therewith.

Other barrier compositions which may be used with benefit in films in accordance with the persent invention are vinyl chloride polymers which contain a predominant amount of vinyl chloride therein, and beneficially, fluorocarbon polymers, fluorohydrocarbon polymers and fluorohalohydrocarbon polymers and fluorohalohydrocarbon polymers may also be used with benefit.

Beneficially, in the extrusion of the vinylidene polymers, it is frequently advantageous and beneficial to incorporate therein a minor portion of a plasticizer, oftentimes a heat stabilizer and a light stabilizer. Such additives are well known in the art and generally are found advantageous in that the temperature required for the extrusion is substantially reduced and the probability of decomposition of the polymer in the extruder is lowered.

In certain instances, it is desirable to add adhesive or bonding layers between the barrier layer and the outer polyolefin layer. The nature of such bonding or adhesive layers must be such that the adhesion between the outer and inner layer is increased as increased seal strength and resistance to delamination are to be obtained.

Beneficially, the adhesive layer will vary in thickness from 0.05 to 0.8 mil (.00127 to .02 mm); however, generally the preferred range of adhesive layer thickness is from 0.1 to 0.3 mil (.0025 to .0076 mm) in thickness. Oftentimes the strength of the bond between the inner or core layer and the outer or surface layer increases slowly as the thickness of the adhesive layer is increased, and generally little or no increase in the bond strengths occurs after the thickness of the bonding layer has reached 0.5 to 0.6 mil (.0127 to .015 mm).

A wide variety of polymers and polymeric compositions are useful to increase the adhesion between the polyolefin outer layer and the inner barrier layer. Suitable polymers or polymeric compositions are readily selected by determining the bonding strength of the composition being evaluated by forming a two-layer extrusion. The bond strength of the resultant two-layer laminate is readily determined by conventional peel strength tests. Similarly, the adhesive layer composition is evaluated by a similar extrusion utilizing the polyolefin material.

In the instance of adhering layers of polyolefins such as polyethylene and polypropylene to vinylidene chloride polymers, polymers which are particularly advantageous are copolymers from 13 weight percent to 35 weight percent vinyl acetate with from 87 weight percent to 65 weight percent ethylene, copolymer of from 20 to 30 weight percent ethylacrylate with from about 80 to 70 weight percent ethylene, copolymers from 30 to 70 weight percent ethylene, copolymers from about 20 to 30 weight percent isobutyl acrylate with from about 80 to 70 weight percent of ethylene, chlorinated polyethylene containing from about 25 to 40 weight percent chloride and polyvinyl chloride.

Composite film, for the practice of the present invention, is readily prepared by heat-plastifying a core-forming polymer and heat-plastifying a polyolefin material, such as employed in the outer layers, i.e. while in the heat-plastified condition, deforming the polyolefin to form a layer of polyolefin resin disposed generally about the core forming resin in the absence of fluid, deforming the heat-plastified materials into a stream, deforming the stream into a film-like configuration, passing the resultant composite heat-plastified stream into a cooling zone and lowering the temperature of the stream below the thermoplastic temperature thereof.

The invention is further illustrated with reference to the accompanying drawings wherein:

Figure 1 is an isometric representation of a package, in accordance with one embodiment of this invention.

Figure 2 is an alternative embodiment of a package, in accordance with the invention;

Figure 3 illustrates a pouch or package, in accordance with another embodiment of the present invention;

Figure 4 is an enlarged, exaggerated cross-sectional view of a portion of the film employed to prepare the containers of this invention;

Figure 5 is a view of a package, in accordance with a further embodiment of the present invention and

Figure 6 is an alternative embodiment of a package, in accordance with the invention.

In Figure 1, there is illustrated a package generally designated by the reference numeral 10. The package 10 comprises a

first panel 11, which is a layered synthetic resinous film having a barrier layer of a halogenated hydrocarbon resin disposed between two layers of a polyolefin resin such as polyethylene or polypropylene. The panel 11 has a first face 12 and a second face 13. A tear strip 15 is adhered to the face 13 and partially deforms the adjacent region of the panel 11. A second similar tear strip 17 is remotely disposed and in generally parallel relationship to the first tear strip 15. A second panel 18 is disposed adjacent to the panel 11, and is joined thereto by means of a first edge seal 20 and a second edge seal 22. A plurality of lateral seals 24 and terminal seals 24*a*, in generally parallel spaced relationship extending from the edge seals 20 and 22, define a plurality of pockets or spaces 26 which are hermetically sealed. An elongated object, e.g. cigar, 28, is disposed within each of the spaces 26. Each of the seals 24 includes a plurality of perforations 29.

The package 10 of Figure 1 is readily fabricated by a variety of methods. One such method is to prepare a panel, such as the panel 11, in strip form and adhere a tear strip to one face, such as the face 13, by means of disposing a strandular material along the surface, sealing or otherwise adhering the strip in the desired location, positioning the panel 18, forming the seals 24 laterally, extending across a length of film from which the package is being prepared, inserting the elongate objects such as the cigars into each space such as the space 26 between adjacent seals 24 and then forming the terminal seals 20 and 22.

Alternatively, the two panels may be placed in face to face engagement, the seals 22 and 24 prepared and the elongate objects positioned within the compartments and subsequently the seal 20 formed.

In Figure 2 there is illustrated a view of an alternative package, in accordance with the present invention, generally designated by the reference numeral 35. The package 35 comprises a first or front panel 36 and a second or rear panel 38. The panels 36 and 38 are adhered to each other by a first edge seal 39 and a second edge seal 40. A plurality of lateral or transverse seals 42 join the panels 36 and 38 to form a plurality of separate hermetically sealed pockets or compartments 44. Each of the pockets 44 contains an elongated object such as a cigar 46. A tear strip 47 substantially similar to that of Figure 1 is disposed longitudinally on each of the pockets 44 in the panel 36. Beneficially a plurality of perforations 49 are provided in each of the seals 42 to permit ready separation of the individual compartments from each other.

The embodiment of Figure 2 is prepared in a manner generally similar to that employed in the fabrication of the package 10 of Figure 1. The embodiment of Figure 2 has the advantage of a longitudinally disposed tear strip which permits the entire compartment, or pocket 44, to be opened for the removal of the contents. However, the embodiment of Figure 1 offers economy of fabrication. Generally the sealing can be accompanied using conventional hot jaw heat sealers, impulse sealers, hot roll sealers and ultrasonic sealers, wherein a stylus vibrating at ultrasonic frequencies presses the film together to cause bonding thereto. Beneficially the tear strip is incorporated in the panel prior to sealing the portion of the second panel. A satisfactory and beneficial tear strip can be provided by various well known means including the provision of a strand such as a thread which is partly imbedded within the face of the panel, which is to be disposed adjacent the second panel by means of heat sealing or the like, and subsequently, heat sealing adjacent the thread. Gentle tension on the thread causes it to cut through the film and form an opening of the compartment in the desired location.

In Figure 3 there is illustrated a pouch or package generally designated by the reference numeral 50. A pouch 50 comprises a first panel 51 and a second panel 52. The panel 51 comprises a flap 53 and a pouch portion 54. The panel 51 is a generally rectangular configuration as are the flap or pouch portion 53 and 54, respectively. The second panel 52 is disposed in generally face to face relationship with the pouch portion 54 of the panel 51 and is affixed thereto by means of a first edge seal 56 and a second edge seal 57. A generally transverse centrally disposed seal 58 secures the edge of the second panel 52 to the panel 51 generally adjacent the flap portion 53. Beneficially the second panel 52 is formed by folding over on itself a portion of a rectangular sheet such as is illustrated in Figure 3 or alternatively separate panels may be employed and joined at a location generally corresponding to a bottom portion of the pouch 60. Generally adjacent the seal 58 is disposed a tear strip 61, the tear strip 61 is disposed between the panel 52 and the pouch portion 53 of the panel 51 and is adapted to sever the panel 52 adjacent the seal 58 remote from the flap 53, thus, providing access to the interior of the pouch and the contents thereof. Disposed within the pouch is smoking tobacco 62.

In Figure 4 there is illustrated a sectional view of a synthetic resinous thermoplastic film 68, the film 68 comprises an interior layer 69 of a transparent barrier material, a first outer layer 70 of a resinous polyolefin such as polyethylene, a second outer layer 71 also comprising a resinous polyolefin.

A pair of adhesive layers 73 and and 74 serve to bond the outer layers 70 and 71 to the inner layer 69. Pouches, in accordance with the present invention, are readily prepared by heat sealing the thermoplastic resinous film into the configuration of Figure 3. Generally the sealing can be accomplished using conventional hot jaw heat sealers impulse sealers, hot roll sealers and ultrasonic sealers, wherein a stylus vibrating at ultrasonic frequencies press the film together to cause bonding thereto. Beneficially the tear strip is incorporated in the second panel prior to sealing the portion of the second panel adjacent the flap 53 together with panel 51. A satisfactory and beneficial tear strip can be provided by various well known means including the provision of a strand such as a thread which is partly embedded within the face of the panel 52, which is to be disposed adjacent the panel 51 by means of heat sealing or the like, and, subsequently heat sealing adjacent the thread. Gentle tension on the thread causes it to cut through the panel 52 and form a mouth or opening of the pouch, in the desired location.

In Figure 5, there is illustrated a view of a package of tobacco, in accordance with the present invention, generally designated by the reference numeral 110. The package 110 compirses a first panel 111 of a flexible material. The panel 111 has a first end 112, a second end 113, a first edge 115 and a second edge 116. The panel 111 defines a plurality of perforations 114, generally centrally disposed and extending between the edges 115 and 116. A second panel 117 having a generally rectangular configuration is disposed adjacent the first end 112 of the panel 111, and is sealed thereto by means of edge seals 118 and 119, and a centrally disposed transverse seal 120. Beneficially the panel 117 is formed from a strip of material employed to form the panel 111, and is integral therewith. The first portion 112 of the panel 111 and the second panel 117 defines a first hermetically sealed compartment 121 containing tobacco 122. A third panel 123 is disposed adjacent the second end 113 of the panel 111, and in the manner of the second panel 117, has an area which is less than one-half the area of the panel 111. The third panel 123 is secured to the second portion 113 of the panel 111 by means of edge seals 124 and 125 and a generally centrally disposed transverse seal 126. The third panel 123 and the second portion 113, of the panel 111, defines a hermetically sealed compartment, a space 126 containing tobacco 127. Adjacent the centrally disposed seals 120 and 126 are disposed opening means 128 and 129, respectively. The opening means 128 and 129 beneficially are tear strips adapted to sever portions of the panels 117 and 123, when pulled. Beneficially the distance between the seals 120 and 126 is at least sufficient to provide flap portions 130 and 131 of the first panel 111. The flap portions terminate at the perforations 114.

The embodiment of Figure 5 provides a tobacco package which optionally may be separated by the user to provide two sealed packages, which may be opened as the contents are required. By dividing a convenient quantity of tobacco, into two portions, and sealing into separate hermetically sealed containers, each small and each with a flap portion, it can readily be appreciated that it is not necessary to separate the two pouch portions and that the package 110, as illustrated, is readily rolled in such a manner that either pouch portion may be employed as a flap for the other.

In Figure 6 there is illustrated an alternative package, in accordance with the invention, generally designated by the reference numeral 140. The package 140 comprises a first panel 141 of a flexible material. The panel 141 has a first end 142, a second end 143, a first edge 145 and a second edge 146. A second panel 147, having a generally rectangular configuration is disposed adjacent the first end 142 of the panel 141, and is sealed thereto by means of edge seals 148 and 149, and a centrally disposed transverse seal 150. Beneficially the panel 147 is formed from a strip of material employed to form the panel 141 and is integral therewith. The first portion 142, of the panel 141, and the second panel 147 defines a first hermetically sealed compartment 151 containing tobacco 152. A third panel 153 is disposed adjacent the second end 143, of the panel 141, and in the manner of the second panel 147 has an area which is less than one-half the area of the panel 141. The third panel 153 is secured to the second portion 143 of the panel 141 by means of edge seals 154 and 155, and a generally centrally disposed transverse seal 161. The third panel 153, and the second portion 143 of the first panel 141, define a hermetically sealed compartment, or space 156 containing tobacco 157. Adjacent the centrally disposed seals 150 and 161 are disposed opening means 158 and 159, respectively. The opening means 158 and 159 beneficially are tear strips adapted to sever portions of the panels 147 and 153, when pulled. Beneficially the distance between the seals 150 and 156 is at least sufficient to provide a bridging portion 160 of the first panel 141.

In the embodiment of Figure 6 the compartments are disposed in closely spaced adjacent relationship, and each acts as a flap for the other, depending upon which end the package is rolled from.

EXAMPLE I

By way of further illustration, cigars are packaged, in accordance with Figure 1, utilizing a film consisting of an outer layer of low density polyethylene having a thickness of 1.53 mils (.27 mm), an intermediate or glue layer of a copolymer of 72 weight percent ethylene and 28 weight percent vinyl acetate having a thickness of 0.1 mil (.0025 mm) a central or barrier layer of 0.2 mils (.005 mm) in thickness of 93.75 parts by weight of a copolymer of 85 weight percent vinylidene chloride and 15 weight percent vinyl chloride, 4.5 parts by weight acetyl tributylcitrate, 1 part by weight of an epoxidized soyabean oil, 0.75 parts by weight of 4-tertiarybutyl-salol, a similar 0.1 mil (.0025 mm) thick layer of ethylene-vinyl acetate copolymer and a 1.53 mil (.27 mm) layer of polyethylene to provide a coherent five-layer film. The package is prepared by heat sealing and cotton thread employed as the tear strip. The resultant package is flexible, and has a desirable and pleasant hand. Extensive storage, of cigars within the package, indicate excellent moisture retension within the package.

EXAMPLE II

A similar package is prepared employing the arrangement illustrated in Figure 2. Similar, beneficial and advantageous results are achieved, however, the individual cigars are somewhat more easily removed than from the package prepared, in accordance with the configuration of Figure 1.

EXAMPLE III

A plurality of pouches are prepared having the configuration of Figure 3 by cutting a portion of a film to a suitable size, positioning a portion of a cotton thread along a shorter side of the panel, and applying sufficient heat to the panel, remote from the thread to cause the thread to be partially embedded therein. A portion of the film containing the thread is then folded as is illustrated in Figure 3, to a configuration wherein the thread is adjacent a major portion of the film or first panel. Edge seals 56 and 57 are made by heat sealing. Ninety grams of smoking tobacco are placed within the pouch and the second panel is sealed to the first panel by means of a heat seal generally adjacent the tear strip in such a manner that the tear strip is disposed within the compartment formed by the heat sealing of the second panel to the first. The resulting pouch has hermetically sealed therein the tobacco. The film employed was the same as that used in Example I.

Evaluation of such pouches indicates exceptional resistance to drying on prolonged storage, a pleasing soft hand, and the ability to maintain tobacco in desirable smoking condition after opening for periods of time in excess of that usually obtained employing commercially available single use tobacco pouch-type packages.

EXAMPLE IV

By way of further illustration, packages were prepared in accordance with Figures 5 and 6, utilizing a film prepared as in Example I.

The package was prepared by heat sealing and cotton thread employed as the tear strip. The resultant package was flexible, and had a desirable and pleasant hand. Evaluation of the packages indicated that excellent protection was obtained for the contents and the selection of the embodiment of Figures 5 or 6 was primarily a matter of personal preference with the user. The use of a multiple compartment pouch, of the present invention, provides substantially more moist tobacco, over a longer period of time, for a given quantity of tobacco than does a single compartment pouch.

Similar, beneficial and advantageous packages were prepared using varying thickness of polyethylene or polypropylene in combination of a barrier core e.g. as Saran (Registered Trade Mark) or vinylidene chloride copolymers as hereinbefore described. Pouches of the present invention as illustrated in Figures 3, 5 and 6 are readily refilled and reused a number of times without loss of beneficial barrier characteristics or deterioration of the pouch. They withstand folding, bending, crumbling and abrasion extremely well and are relatively inexpensive.

WHAT WE CLAIM IS:—

1. A plastics container for tobacco products comprising one or more hermetically sealed compartments the container being made of synthetic resinous thermoplastic film having three layers, the two outer layers each being composed of a polyolefin film and the inner layer comprising a barrier resin, the three-layer film being made by separately heat-plastifying a stream of the barrier resin and a stream of the polyolefin material, deforming the polyolefin stream so as to form a layer surrounding the barrier resin stream, deforming the thus formed composite stream into a film, and passing to a cooling zone.

2. A plastics container as claimed in claim 1 which is a tobacco pouch comprising a first panel and a second panel, the first panel comprising a pouch portion and a flap portion, the second panel peripherally sealed to the pouch portion of the second panel, the first panel and the second panel having a tobacco containing space therebetween, a tear strip positioned in the second panel generally adjacent the flap portion of the first panel and adapted to sever the first

panel to provide access to the hermetically sealed space and the tobacco.

3. A plastics container as claimed in claim 1 which is a tobacco pouch comprising a first panel of sheet material, the first panel being of generally rectangular configuration and having a first end and a second end, a first edge and a second edge, a second panel having an area less than one-half the area of the first panel, the second panel being disposed adjacent the first end of the first panel and sealed thereto about the edges thereof to provide in cooperative combination with the first panel a hermetically sealed compartment, means to open the first compartment disposed generally toward the center of the first panel and extending generally from the first edge to the second edge of the first panel, a third panel of generally rectangular configuration disposed adjacent the second end of the first panel, the third panel having an area substantially less than one-half of the first panel, the third panel being sealed to the second end of the first panel to form a second hermetically sealed compartment remotely disposed from the first compartment, means to open the second compartment being disposed generally toward the means to open the first compartment, the means extending generally from the first edge to the second edge of the first panel and smoking tobacco being disposed within the first and second compartments.

4. A plastics container as claimed in claim 1 for elongated tobacco products comprising a first panel and a second panel, the first panel and the second panel being bonded together in face to face arrangement at selected portions to provide a plurality of hermetically sealed compartments, each compartment containing an elongated tobacco product disposed within at least one of the hermetically sealed compartments.

5. A plastics container as claimed in any one of the preceding claims wherein the barrier resin is a halogenated hydrocarbon resin.

6. A plastics container as claimed in claim 5 wherein the halogenated hydrocarbon resin is a polymer of vinylidene chloride.

7. A plastics container as claimed in any one of the preceding claims wherein the synthetic resinous film has a thickness of from 1.2 mils to 8 mils.

8. A plastics container as claimed in claim 7 wherein the synthetic resinous film has a thickness of from 2 to 6 mils.

9. A plastics container as claimed in any one of the preceding claims wherein each of the layers comprising the synthetic resinous thermoplastic film is transparent.

10. A plastics container as claimed in any one of the preceding claims wherein an adhesive layer is provided between the inner layer and the outer layers comprising the resinous thermoplastic film.

11. A plastics container as claimed in claim 10 wherein the adhesive layer has a thickness from 0.05 to 0.8 mil.

12. A plastics container for tobacco products substantially as hereinbefore described with reference to Figures 1, 1 and 4; 2; 2 and 4; 3; 3 and 4; 5; 5 and 4; 6 or 6 and 4 of the accompanying drawings.

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111 & 112, Hatton Garden, London, E.C.1.
Chartered Patent Agents.
Agents for the Applicants.

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1,139,036
3 SHEETS

COMPLETE SPECIFICATION

This drawing is a reproduction of the Original on a reduced scale.

SHEET 1

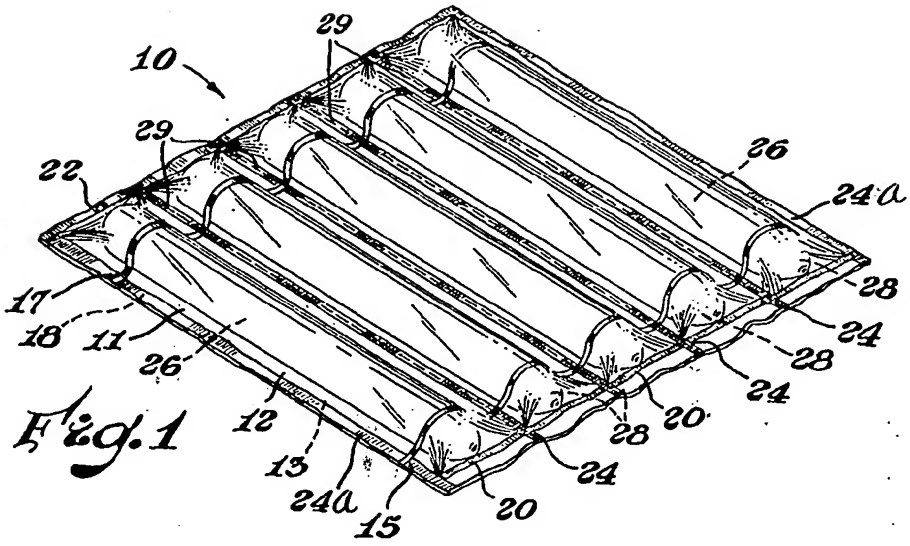

Fig. 1

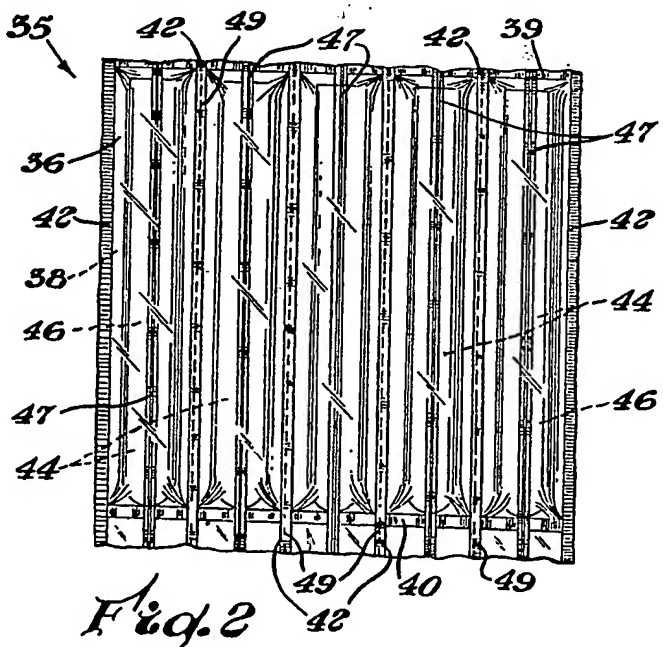

Fig. 2

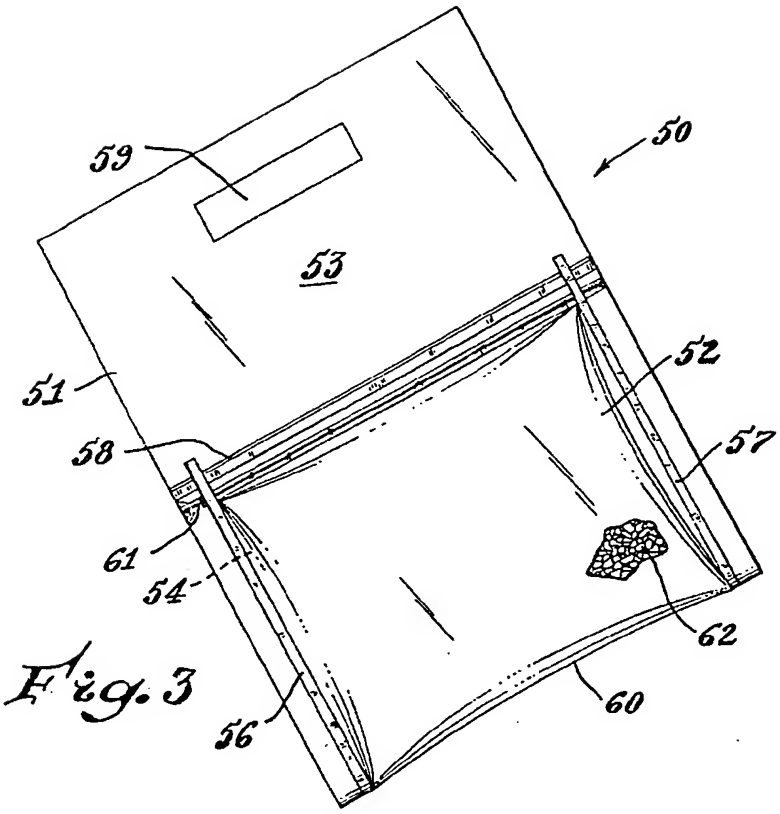

Fig. 3

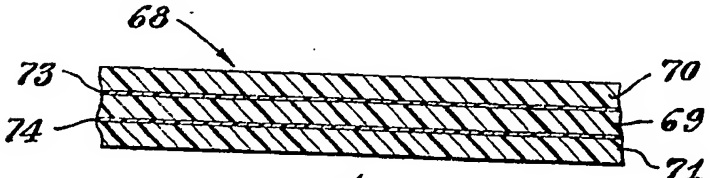

Fig. 4

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SHEETS 2 & 3

Fig. 5

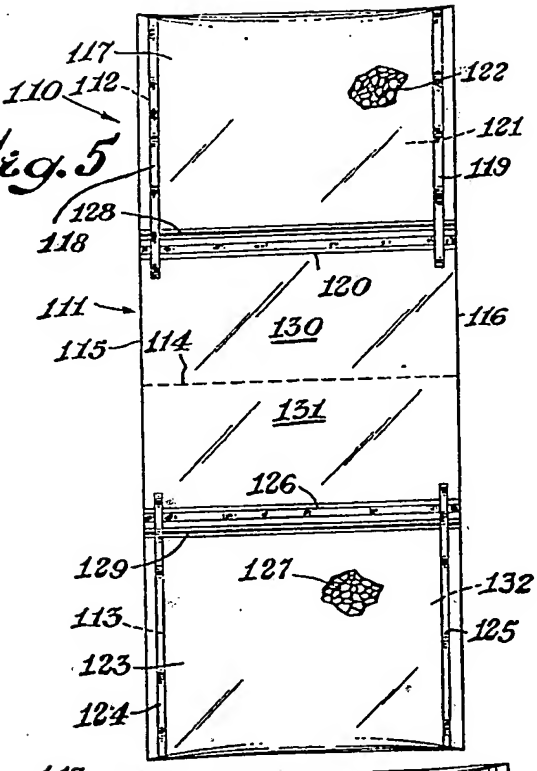
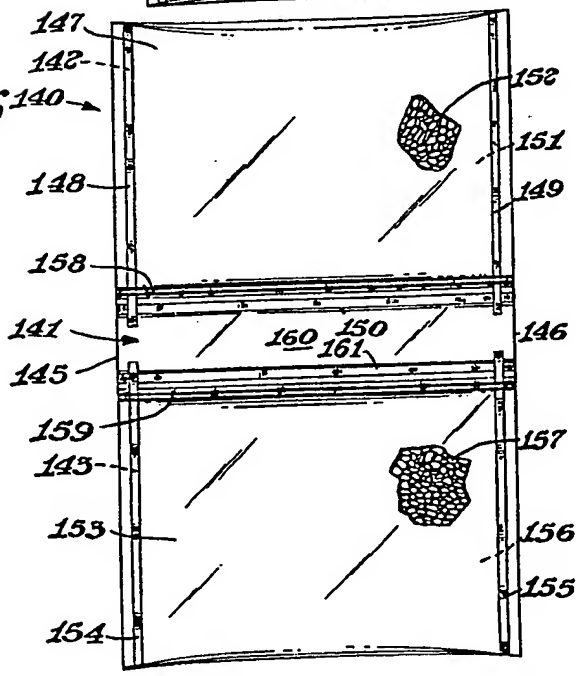


Fig. 6



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SHEETS 2 & 3

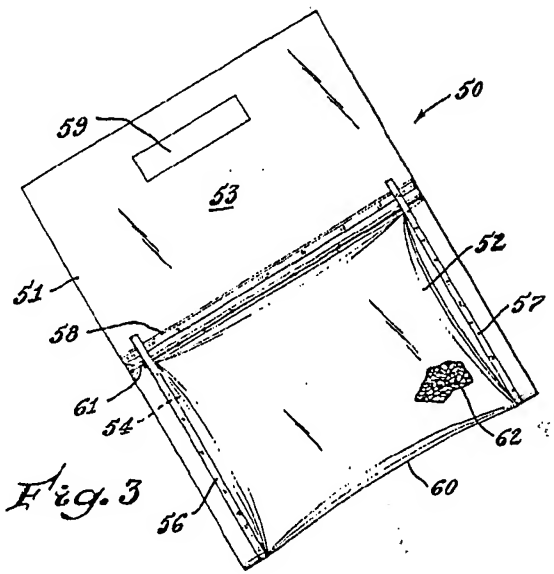

Fig. 3

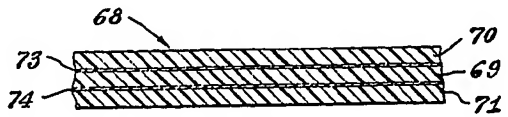

Fig. 4

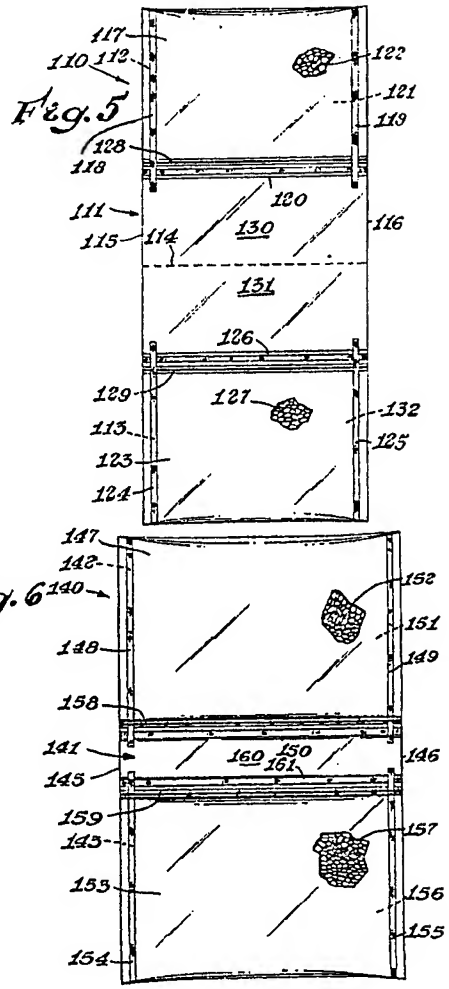

Fig. 5

Fig. 6